2022

# VISITOR USE MONITORING REPORT


TAHOE RIM TRAIL ASSOCIATION

**REPORT SUMMARY**

In order to better understand trail use levels and trends, the Tahoe Rim Trail Association (TRTA) deploys passive infrared and magnetic trail counters in various places within the Tahoe Rim Trail (TRT) system. In 2022, data from 27 counters was successfully recovered, and the data collected have been analyzed. Most counters were installed from mid-June to July 1st. For the purposes of this report and to determine trends, July 1st – September 15th are used as a common timeframe for analyses.

In addition to Trail Counter data, the TRTA had staff and volunteers stationed at four major trailheads (Echo Lakes, Brockway East, Van Sickle, 64 Acres) to do manual counts and, when possible, determine a trail user's primary destination. The TRTA also did remote backcountry monitoring to understand trail user camping impacts, assessing illegal camping at Star Lake and Showers Lake.

Although the data does have limitations, the conclusions reached in this report represent a good-faith effort to evaluate trail use on the TRT system using the best available information. With the results reported here, and by collecting additional data in the future, the TRTA and its partners can have defensible data upon which to make management decisions.

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## PROGRAM OVERVIEW

Both anecdotal and scientific observations have concluded that recreational use in the Tahoe Basin is on the rise and is currently at historically high levels. Visitation to the Lake Tahoe Basin is estimated at over 22 million annually, and among those visitors' recreation in the form of hiking and mountain biking is more popular than ever before. Understanding use levels and trends on the trail is essential for adjusting management strategies to meet evolving challenges.

The Tahoe Rim Trail Association (TRTA) owns infrared (IR) trail counters and magnetic bicycle (MB) counters. The IR counters collect information on all trail users, while the MB counters collect information only on wheeled traffic (mountain bikes). Most of these counters are TRAFx trail counters. However, in 2022, the TRTA acquired two Eco-Counters, as permanent installations on high-use trail areas. Eco-Counter trail counters can record and distinguish between a biker and a hiker along with the direction of travel. Both trail counter types collect data in the form of individual trips or hits: each time someone passes the counter, a single trip or hit is recorded. Counters allow for close monitoring of multiple sites around the trail at any given time and can potentially provide data for informing critical management decisions.

To supplement trail counting, in 2022, the TRTA's Trailhead Ambassador program had volunteers and staff stationed at major trailheads doing manual counts with clickers and recording user type (day hiker, backpacker, biker) and primary destination. Other key data points collected included demographic information such as local, national, or international visitors. In 2022, volunteers and staff spent at least three different weekend days during the busy summer and early fall months at the following major trailhead locations: Van Sickle, 64 Acres, Brockway East, and Echo Lakes.

In order to expand understanding of the numerous remote backcountry destinations that the TRT system connects trail users to in the Tahoe Basin; in 2022, the TRTA also had staff camp at popular alpine lakes –Showers Lake and Star Lake, to do campsite inventories used by USFS personnel and to interact with trail users and determine backcountry trip destinations. This remote backcountry monitoring helped to improve understanding of the number of illegal camping spots, non-designated social trails, and other valuable information. This work also helps inform land management agency partners about the impact of camping on natural resources and what additional measures may be needed to minimize that impact, such as future designated camping or increased signage conveying rules.

The data gathered through this Visitor Use Monitoring program is particularly useful for identifying and managing high-use areas where additional resources may be warranted to reduce environmental risks, repair or prevent tread deficiencies, or mitigate natural resource damage. In addition, the data is essential for establishing baseline use numbers before connector trails or reroutes are built and for assessing the increased traffic from those trails. Further, the counters, manual counts, and backcountry monitoring are powerful ways to monitor illegal trail use, such as illegal camping and mountain bike incursions into designated wilderness areas. The data from this program can also be used to more accurately assess the overall number of trail users on the Tahoe Rim Trail (TRT) and to create stronger arguments regarding relevancy when competing for funding, marketing the TRTA's services, or any time that quantifying the significance of the trail would be useful.

*The TRTA would like to thank Nevada Energy Foundation and the Nevada Division of State Lands - Lake Tahoe License Plate Program for their generous support of this program.*

## PROGRAM GOALS

The overall goal of the Visitor Use Monitoring program is to provide data to support decisions made both on and off the trail. In general, the goals of this program are to:

1) Collect high-quality data on trail use through remote counters,
2) Collect high-quality-data on trail use through observation, interactions, and manual counts at major access points and in popular backcountry areas,
3) Develop a digital database that stores information derived from the counters, and
4) Analyze and share the data with staff, volunteers, partners, and the public so that it can be used to inform management decisions, fundraising, and other programs.

Specifically, for 2022, this report seeks to analyze collected data to answer the following key questions:

- What is the annual number of trail users using the TRT?
- What are some trail use trends? How does the 2022 data compare to previous years?
- Which areas of the trail are the most popular for hiking, biking, and camping?
- How much illegal camping occurs at popular alpine lakes that the TRT connects to?

The digital databases that store and help analyze the data recorded by the trail counters are maintained through a Geographical Information System (GIS) and online via the TRAFx Datanet and Eco-Counter websites.

This report was developed to share the knowledge gained through the Visitor Use Monitoring program throughout the TRTA and amongst partners.

## 2022 COUNTERS

In 2022, 30 trail counters were active in the field. In total, 27 trail counters (IR and MB) collected usable field data for analysis (see the below link or Map 1 and Map 2 for exact locations). The only location not on these maps is the counter near the TRT and Tamarack Lake Trail intersection. Though it varied by the counter, on average, the devices collected data for three months from mid-June to mid-September. The three IR counters that collected no data were located near Watson Lake (stolen), the Echo Summit Reroute (taken out of the field after malfunctioning), and Spooner North Trailhead (malfunctioned and stopped collecting data accurately).

To review counter locations in greater detail, the following map is available:

https://arcg.is/0faLSC

## LIMITATIONS

The data and conclusions presented in this report are a result of a good faith effort to accurately portray trail use on the Tahoe Rim Trail (TRT) system based on limited information. Both passive infrared and magnetic counters have known issues in collecting accurate numbers of users when they travel in

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groups and therefore tend to undercount. In addition, manual counts at busy trailheads as part of the Trailhead Ambassador program are susceptible to human error.

The EcoCounters, in particular, were installed to be left permanently at their locations without having to retrieve data from each site. However, data was not transmitted remotely due to the logger technology not being strong enough to boost the signal. This meant collecting the data manually, which required digging up EcoCounter and using an EcoCounter app to retrieve the data. As a result, data was not collected as frequently at these locations.

## INFRARED COUNTERS & ANALYSIS TECHNIQUES

### Trail Use Levels

In order to answer the question, "Which areas of the trail receive High, Moderate, and Low use?" data on the Average Daily Trips (ADT) from the IR counters were utilized. Not all counters collected data during the same time periods, so data from July 1 through September 15 (76 days) were used as a common time frame. This period was used because it encompasses the mostly snow-free season during which most trail use occurs and because most IR counters installed in recent years have been active during that same time. This allows us to compare the data from previous years to see any significant changes in trail usage. Because 2021 was a wildfire-prone season, the smoke and forest service closures resulted in lower trail use numbers. As a result, compared to 2021, 2022 shows a significant increase in trail use.

To extrapolate use levels for sections of the trail from the collected counter data, it was assumed that users were either going out and back on the TRT from an access point to a major attraction (such as from the Mt. Rose Summit parking area to Galena Waterfall) or were creating a loop using the TRT and another intersecting trail. This method somewhat discounts long-distance trail users and assumes that most are day hikers returning to their starting location rather than point-to-point and/or overnight use. This assumption helped us calculate how many total users were captured with these IR counters.

In order to better show trail use patterns, the results of the IR data are organized and analyzed by the nine different TRT segments: Tahoe City to Brockway Summit, Brockway Summit to Mt. Rose/Tahoe Meadows, Mt. Rose/Tahoe Meadows to Spooner Summit, Spooner Summit to Kingsbury North, Kingsbury North to Kingsbury South, Kingsbury South to Big Meadow, Big Meadow to Echo Lakes, Echo Lake to Barker Pass, and Barker Pass to Tahoe City.

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**Map 1: IR Trail Counter Locations**

## OVERALL TRAIL USE TRENDS

To answer the question, "What are the trends in trail use in general and on different segments?" historic counter data from 2016-2020 were analyzed alongside 2022 data. 2021 data were excluded due to the wildfires that severely impacted trail use. Over time, the percent change in ADT was calculated by comparing counter data from the exact location during the same calendar dates from different years.

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To answer the question, "How many trail users recreate on the Tahoe Rim Trail system annually?" three issues must be addressed. First, the trip calculations made by the counters must be converted into unique users. Second, the data from the counters must be extrapolated to estimate use over the entire trail system. Third, data from a short time period must be extrapolated to estimate use over an entire year. No foolproof method exists to accomplish these three tasks, so the final result will be somewhat speculative. Nevertheless, the estimate will improve as more data are collected yearly in various locations along the trail.

To convert trail count numbers from trips to users, they must be multiplied by a factor between 0.5 and 1. Multiplying by a factor of one would indicate that each trip represents one user and that each user only passed by the trail counter once during their trip. This assumes that there were no out-and-back trips past the same counter, and no one was counted by two counters on the same trip. Multiplying by a factor of 0.5 would indicate that each user passed the counter twice, meaning that every trip was out and back. There is no data on how many trips were out-and-back or covered enough distance to register on two counters, but based on observational and anecdotal evidence from the Trailhead Ambassador program, it is reasonable to assume that most users on most trail sections were out-and-back day use and that a majority of users were counted only by one counter on the same trip. To represent a balance between these assumptions, a factor of 0.7 is used when determining the number of users from the IR data.

To extrapolate data from limited locations to estimate use covering the entire trail system, the number of users must be multiplied by another factor. To calculate this percentage, the estimated number of miles each IR counter covered was divided by the total mileage of the TRT (174.5). Based on the results presented in previous reports and in the Trail Use Levels section of this report (see Table 1), trail use data is available for approximately 29.2% of the trail system in 2018, approximately 22.5% of the trail system in 2019, approximately 15.0% of the trail system in 2020, approximately 23.0% of the trail system in 2021, and approximately 29.7% in 2022. The data from each year was multiplied by a factor corresponding to each year's percentage to yield an estimate of the trip data extrapolated to cover 100% of the trail system.

## IR COUNTER & TRAILHEAD AMBASSADOR RESULTS

### Trail Use Levels

The Average Daily Trip (ADT) for each IR trail counter in 2022 ranged between a low of 21 and a high of 355, with an average of 107. This number indicates a return to pre-wildfire and pre-COVID trail use numbers. By comparison, previous ADT averages collected by IR counters from 2018 to 2021 were 70.2, 99.7, 50, and 95.71.

Areas of the trail identified as High use (100 or more average users per day) comprised 17 miles or 9.7% of the TRT system and included:

1) Mt. Rose trailhead to Galena Waterfall,
2) Echo Lakes trailhead to Lake Aloha,
3) Brockway East trailhead to Picnic Rock,
4) Echo Lakes trailhead to the southern boundary of Desolation Wilderness,
5) Big Meadow trailhead to Big Meadow/Round Lake and Scotts Lake,
6) Tahoe Meadows trailhead heading south to Chickadee Ridge,

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Areas of the trail identified as Moderate use sections (40 to 99 average users per day) comprised 16 miles or 9.2% of the TRT system and included:

1) Tamarack Lake and TRT junction in Desolation Wilderness,
2) Barker Pass North trailhead to PCT junction,
3) Spooner South trailhead before Genoa Peak Road,
4) Kingsbury North trailhead access trail to TRT junction,
5) Brockway West trailhead heading toward Watson Lake,
6) Brockway East trailhead passed Martis Peak Rd,
7) Mt. Rose Wilderness near Gray Lake.

Areas of the trail identified as Low use sections (less than 40 average users per day) comprised 18 miles or 10.3% of the TRT system and included:

1) Barker Pass trailhead heading south toward Richardson Lake,
2) Tahoe City North (Fairway Drive) trailhead toward Thunder Cliff Vista,
3) Kingsbury North Stinger and TRT intersection,
4) Spooner South trailhead past Genoa Peak Road heading toward the Bench,
5) Kingsbury South trailhead or High Meadow access point to Star Lake,
6) Kingsbury South trailhead or High Meadow access point to Monument East Peak,
7) Grass Lake Connector Trail toward Armstrong Pass,

*Photo: Most ADT to Picnic Rock - View from Picnic Rock. Photo Credit: Randy Dickey*

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TABLE 1:

| Counter Name | Average Daily Trips | Use Level |
|---|---|---|
| Picnic Rock | 355 | High |
| Mt. Rose Galena Falls | 313 | High |
| Lake Aloha | 271 | High |
| Echo Lakes | 250 | High |
| Big Meadow/Scotts Late Junction | 212 | High |
| Tahoe Meadows South | 104 | High |
| Tamarack Lake | 93 | Medium |
| Barker Pass North | 73 | Medium |
| Spooner South | 58 | Medium |
| Kingsbury North Access | 56 | Medium |
| Brockway West | 52 | Medium |
| Martis Peak Rd | 50 | Medium |
| Mt. Rose Wilderness | 41 | Medium |
| Barker Pass South | 39 | Low |
| Tahoe City North | 32 | Low |
| Kingsbury North Stinger | 32 | Low |
| Genoa Peak Road | 32 | Low |
| Star Lake | 24 | Low |
| Monument East Peak | 21 | Low |
| Grass Lake Spur | 21 | Low |

TRAFx and EcoCounter data for 2022 trends is also available for weekly, daily, and hourly trends at all counter locations. For high-use locations noted above, use was highest between 9:00 am and 12:00 pm. As one might expect, weekends were peak times for use in these areas.

Data for all 2022 trail counters showing these trends is available and hosted on the TRAFx.net Database and Eco-Counter websites. Data is also shared with the Tahoe Regional Planning Agency on a shared platform.

## Trail Use Trends

Most of the locations showed increased use over the period in which data was collected compared with pre-COVID and recent wildfire years (2021 Caldor Fire). Since 2022 was the first year since 2020 that COVID and wildfires did not significantly impact trail use due to forest closure orders or COVID outbreaks, most locations were compared to 2019 or other prior years where data was recorded successfully at that location (see Table 2). The average change in use overall at 19 sites was a 17.99% increase. It is important to note that this number does not reflect all the differences and complications inherent in measuring users over diverse time periods at different locations.

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Notably, there was a significant increase in Average Daily Trips (ADT) in Designated Wilderness areas. The ADT has more than doubled in the last five years in Mt. Rose Wilderness near Gray Lake and in Desolation Wilderness to Lake Aloha. Additionally, there was a large increase of ADT at the Big Meadow/Scotts Lake Junction and Spooner South heading toward Genoa Peak Rd. Finally, Barker Pass North had the largest increase in ADT. This indicates more Pacific Crest Trail thru-hikers than in previous years.

The areas of high use and the ADT suggests many trail users in 2022 were backpacking. In particular, from Big Meadow, Tahoe Meadows, Echo Lakes, and Mt. Rose trailheads where trail users can assess numerous natural features and find more solitude in more remote areas. This is unsurprising and validates what was observed and recorded by Trailhead Ambassadors and Remote Backcountry Monitoring.

**Graphic 1.**

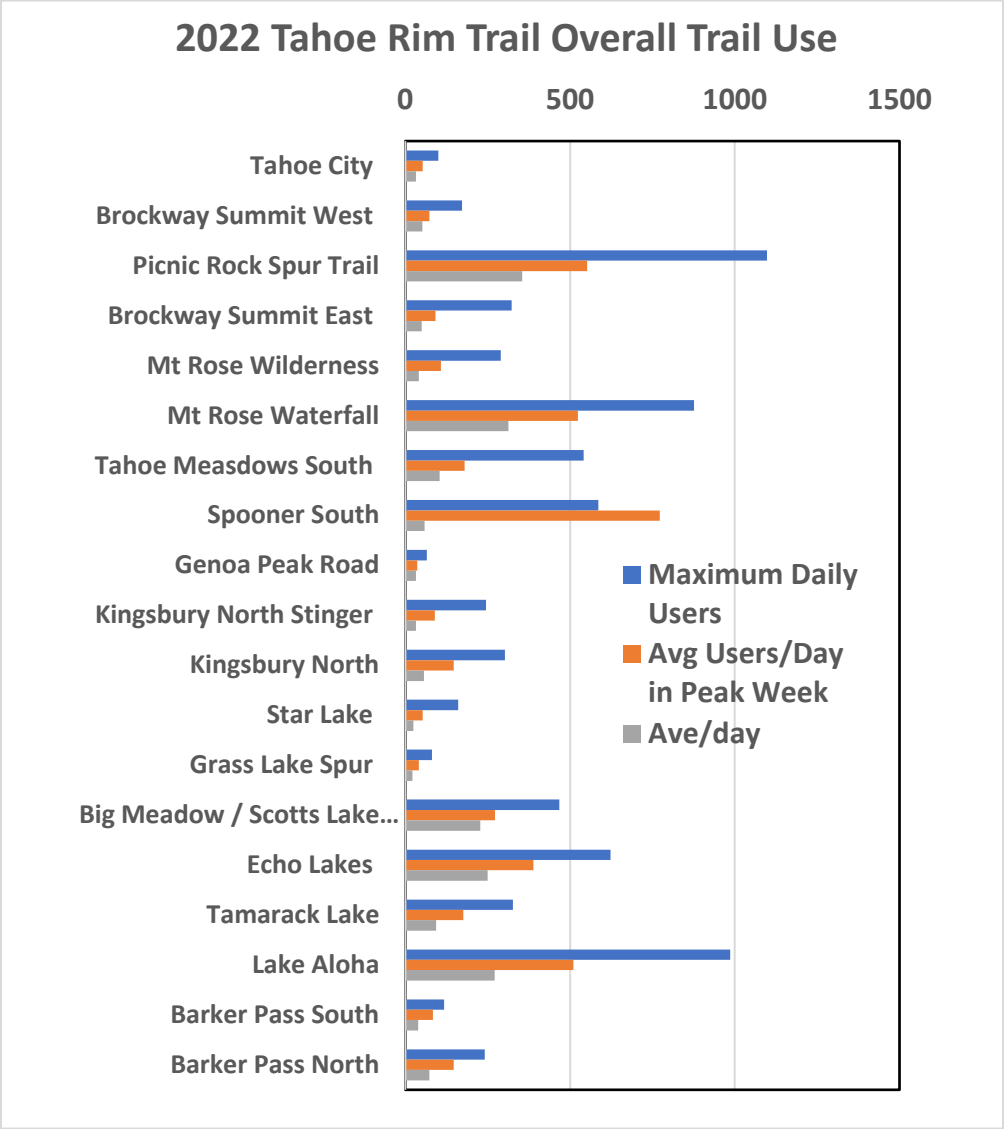


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TABLE 2:

| Counter Name | Data Years and Average Daily Trip | | Time Period Analyzed | % Change |
|---|---|---|---|---|
| | 2019 | 2022 | | |
| Mt. Rose Galena Falls | 438 | 313 | 7.1 – 9.15 | -28.53 % |
| | 2018 | 2022 | | |
| Mt. Rose Wilderness Gray Lake | 20 | 41 | 7.1 – 9.15 | +105 % |
| | 2016 | 2022 | | |
| Big Meadow/Scotts Lake Junction | 122 | 212 | 7.1 – 9.15 | +73.77 % |
| | 2018 | 2022 | | |
| Brockway East (Martis Pk Rd) | 55 | 50 | 7.1 – 9.15 | -9.09 % |
| | 2019 | 2022 | | |
| Picnic Rock | 317 | 355 | 7.1 – 9.15 | +11.98 % |
| | 2019 | 2022 | | |
| Brockway West | 31 | 52 | 7.1 – 9.15 | +67.74 % |
| | 2019 | 2022 | | |
| Echo Lakes | 319 | 250 | 7.1 – 9.15 | -21.63 % |
| | 2018 | 2022 | | |
| Lake Aloha | 149 | 271 | 7.1 – 9.15 | +81.87 % |
| | 2016 | 2022 | | |
| Tahoe Meadows South | 170 | 104 | 7.1 – 9.15 | -38.82 % |
| | 2018 | 2022 | | |
| Star Lake | 47 | 24 | 7.1 – 9.15 | -48.93 % |
| | 2018 | 2022 | | |
| Spooner South | 32 | 58 | 7.1 – 9.15 | +81.25% |
| | 2021 | 2022 | | |
| Genoa Peak Road | 23 | 32 | 7.1 – 9.15 | +39.13 % |
| | 2016 | 2022 | | |
| Barker Pass North | 36 | 73 | 7.1 – 9.15 | +102.77% |
| | 2020 | 2022 | | |
| Barker Pass South | 27 | 39 | 7.1 – 9.15 | +44.44 % |
| | 2019 | 2022 | | |
| Kingsbury North Stinger | 36 | 32 | 7.1 – 9.15 | -11.11 % |
| | 2016 | 2022 | | |
| Kingsbury North Access | 117 | 56 | 7.1 – 9.15 | -52.13 % |
| | 2018 | 2022 | | |
| Tahoe City North | 49 | 32 | 7.1 – 9.15 | -34.69 % |
| | 2016 | 2022 | | |
| Grass Lake Spur | 31 | 21 | 7.1 – 9.15 | -32.25 % |
| | 2015 | 2022 | | |
| Monument East Peak | 27 | 30 | 7.1 – 9.15 | +11.11 % |

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## Trailhead Ambassador Results – Manual Counts & Visitor Interaction

To supplement trail counting, in 2022, volunteers and staff spent at least three different weekend days during the busy summer and early fall months at the following major trailhead locations: Echo Lakes, Brockway East, Van Sickle, and 64-Acres. Trailhead Ambassadors were given a clicker to count the number of users and record their user type (hiker, biker, camper, etc.), primary destination, and demographic information. Domestic visitor types were recorded if they lived more than a 5-hour drive from the Lake Tahoe Region.

Trail use type, demographic information, and primary destination are summarized in the following tables for each trailhead location:

### Echo Lakes Trailhead

| User Type | Average Daily Trip (ADT) |
|---|---|
| Day Hiker | 85 |
| Backpacker | 39 |
| **Visitor Type** | |
| Local | 28 |
| International | 14 |
| Domestic | 67 |
| **Primary Destination** | |
| Completing the TRT | 10 |
| PCTer | 11 |
| Lower/Upper Echo Lakes | 44 |
| Lake Aloha | 48 |
| Lake of Woods | 8 |
| Tamarack lake | 10 |
| Other Desolation Wilderness Location | 5 |

*ADT from manual trail use counts and interactions with visitors from early June 2022 to early September 2022—nine total days of data collection.

### Brockway East Trailhead

| User Type | Average Daily Trip (ADT) |
|---|---|
| Day Hiker | 106 |
| Backpacker | 5 |
| Mountain Biker | 8 |
| **Visitor Type** | |
| Local | 13 |
| International | 4 |
| Domestic | 32 |

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| Primary Destination | |
|---|---|
| Completing the TRT | 6 |
| Picnic Rock | 60 |
| Martis Access Point or Beyond | 10 |

*ADT from manual trail use counts and interactions with visitors from late May 2022 to late July 2022—three total days of data collection.

### Van Sickle Trailhead

| User Type | Average Daily Trip (ADT) |
|---|---|
| Day Hiker | 48 |
| Backpacker | 4 |
| Mountain Biker | 10 |
| **Visitor Type** | |
| Local | 15 |
| International | 9 |
| Domestic | 23 |
| **Primary Destination** | |
| 1st Vista from Trailhead | 14 |
| Waterfall | 13 |

*ADT from manual trail use counts and interactions with visitors from late May 2022 to late September 2022—five total days of data collection.

### 64-Acres Trailhead

| User Type | Average Daily Trip (ADT) |
|---|---|
| Day Hiker | 32 |
| Backpacker | 3 |
| Mountain Biker | 32 |
| E-Bike | 10 |
| **Visitor Type** | |
| Local | 4 |
| International | 3 |
| Domestic | 8 |
| **Primary Destination** | |
| Completing the TRT | 2 |
| Page Meadows | 5 |
| Granlibakken Loop | 3 |

*ADT from manual trail use counts and interactions with visitors from late June 2022 to early September 2022—four total days of data collection.

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Overall, the Trailhead Ambassador data provided valuable data that also validated much of what the trail counter data recorded. All four trailhead locations generally had full parking lot areas by 9:00 AM with the exception of 64-Acres. Both Echo Lakes and Brockway East consistently had full parking lots by 9:00 AM and substantial illegal parking in dangerous areas alongside the highway (Brockway East) and near the Echo Chalet parking lot (Echo Lakes). In addition, the trail counter data for Brockway East and Echo Lakes ranked as high-use trail areas (100+ ADT), consistent with what was found by manual Trailhead Ambassador counts. Of the total counted at Echo Lakes, 52% were going day hiking to lower or upper Echo Lakes to the edge of the Desolation Wilderness Boundary, while 48% were going into Desolation Wilderness as far as Lake Aloha. This data can help inform future plans like the Desolation Wilderness Management Plan and trail development for the Echo Lakes Loop project that the TRTA and land management agency partners have discussed in previous meetings.

## REMOTE BACKCOUNTRY MONITORING

### Campsite Inventory– Showers Lake and Star Lake

2022 was the first year that TRTA staff inventoried and monitored campsites near popular alpine lakes. This was done to aid current USFS efforts that use the same protocols and procedures for monitoring camping impacts on the landscape. The TRTA used the same campsite inventory protocol manual as Eldorado National Forest employees when inventorying campsites in Desolation Wilderness. This manual assists field personnel in completing the Campsite Inventory Worksheet. For further information on how campsites were ranked/rated and to review the entire manual, contact: info@tahoeimtrail.org

The purposes for conducting an inventory of impacts at campsites are: to provide managers with baseline information on resource conditions in the backcountry wilderness, to document campsite conditions so that changes over time can be measured, and to gather information to aid planning processes for future infrastructure like bear boxes, designated camping areas, etc. Information provided by the inventory helps determine strategies for managing recreational impacts in backcountry wilderness areas.

The following findings are from data collected in July 2022 at Showers Lake and Star Lake:

### Campsite Evaluations at Showers Lake

#### Condition Class:

1. Slight Impact
2. Moderate Impact
3. Heavy Impact

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| Total Number of Campsites: | 25 | | |
|---|---|---|---|
| Condition Class: | 1 | 2 | 3 |
| Number of Campsites: | 5 | 13 | 7 |

**Item 1: Total Campsite Area**

| Area (sq ft) | <50 | 50-100 | 100-300 | 300+ |
|---|---|---|---|---|
| # of Campsites | 2 | 6 | 14 | 3 |

**Item 2: Area of Barren Core**

| Area (ft sq) | <30 | 30-100 | 100-300 | 300+ |
|---|---|---|---|---|
| # of Campsites | 2 | 15 | 5 | 3 |

**Item 3: Campsite Durability**

| Rating | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| # of Campsites | 3 | 19 | 0 | 3 |

**Item 4: Campsite Cleanliness**

| Rating | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| # of Campsites | 21 | 2 | 1 | 1 | 0 |

**Item 5: Visibility from Trail**

| Rating | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| # of Campsites | 7 | 4 | 9 | 3 |

**Item 6: Social Trails***

| Rating | 4 |
|---|---|

*See the below graphic for locations.

**Item 7: Damage to Trees**

| Rating | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| # of Campsites | 23 | 2 | 0 | 0 | 0 |

**Item 8: Root Exposure**

| Rating | N | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|
| # of Campsites | 3 | 21 | 2 | 0 | 0 |

**Item 9: Campsites within View**

*The TRTA would like to thank Nevada Energy Foundation and the Nevada Division of State Lands - Lake Tahoe License Plate Program for their generous support of this program.*

| Campsites in View | 0 | 1-3 | 4-7 | 7+ |
|---|---|---|---|---|
| # of Campsites | 2 | 3 | 7 | 13 |

**Item 10: Campsite Development**

| Rating | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| # of Campsites | 21 | 3 | 0 | 1 | 0 |

**Item 11: Proximity to Water***

| Distance (ft) | >10 | 10-50 | 50-100 | 200+ |
|---|---|---|---|---|
| # of Campsites | 2 | 1 | 3 | 19 |

*Six campsites were found less than 200 feet from Showers Lake.

## Key Findings at Showers Lake & Star Lake:

There were only a few campsites at Showers Lake that spanned larger than 50 square feet, most likely representing a conglomeration of multiple large campsites that have been used over and over to the point where the ground and landscape have been altered in a dramatic way over a large area. Most other campsites were contained to about 30 square feet. Around Showers Lake, there were campsites situated right off of the shoreline in riparian areas or what was once a meadowed area. Most of the established campsites at Showers Lake are extremely visible to passer-byers on the trail and are only located about 20 feet off of the trail, which is much less than the recommended 300 feet. There were some established campsites that directly affected other trail users because they were obtrusive, blocking, or hindering the view of the lake and its meadows.

At Star Lake, a more comprehensive data set similar to Showers Lake was not collected. However, there were a total of 16 separate campsites observed. Most campers stayed one night only. The following were frequent questions that were asked and recorded by TRTA staff monitoring this area:

- How far away is Freel Peak from here (Star Lake)?
- How long is the Freel Peak Trail off of the TRT?
- Where is the best place to camp around Star Lake?
- Why do we have to be 200 ft away from the water?

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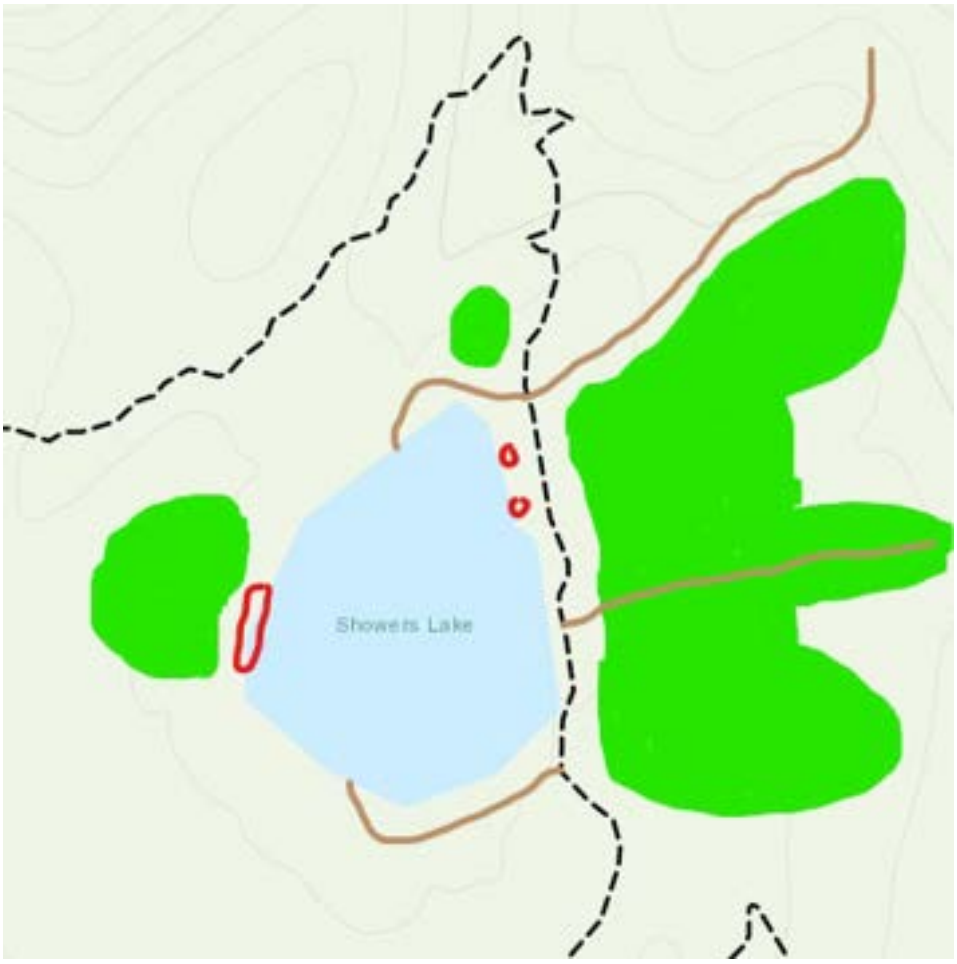
**KEY**

| | |
|---|---|
| Green | Campsites |
| Red | Obtrusive Campsites |
| Brown | Social Trails |




## Overall User Numbers

The IR counters for 2022 produced 207,408 total trips during the nearly three-month peak season of 2022. This number multiplied by 0.7 (to convert trips to users), multiplied by 100/28.6 (to extrapolate over the entire system), and multiplied by 1/0.7 (to extrapolate for the entire year) produces a total of 698,343 estimated users on the TRT system in 2022. Previous reports put the estimates for total users in 2017, 2018, 2019, and 2020 at 634,555, 478,086, 509,884, and 433,013, respectively. For 2021, there were multiple counters that failed that were placed in popular locations that see much more traffic than other segments of the trail. This affected the amount of data that was collected and the extrapolated number of users for 2021. Additionally, the fire, smoke, and forest closures largely contributed to non-standard use patterns that do not occur in normal years.

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## BICYCLE COUNTERS & ANALYSIS TECHNIQUES

### MB COUNTER RESULTS

The ADT for the 2022 mountain bike counters ranged from a low of 18 to a high of 59, with an average of 29.5 (see Table 3) from the same time period of July 1 to September 15. This number would be higher if the Eco-Counter near Picnic Rock collected data consistently. Because of this malfunction, the bike counts from this counter are not included in this analysis.

TABLE 3.

| | 2022 Data - July 1-September 15 | | | Peak Month | | |
|---|---|---|---|---|---|---|
| **Counter Location** | **Total Users** | **# of Count Days** | **Ave/Day** | **Month** | **Total # of Users** | **Ave User/Day** |
| Tahoe City | 1,608 | 91 | 18 | July | 691 | 22 |
| Tahoe Meadows South | 5,605 | 95 | 59 | July | 2248 | 73 |
| Marlette Peak | 3,432 | 114 | 30 | July | 1247 | 40 |
| Van Sickle Connector | 2,096 | 69 | 30 | Aug | 1068 | 34 |
| Grass Lake Spur | 2,226 | 90 | 25 | July | 910 | 29 |
| Big Meadow/Scotts Jct. | 759 | 50 | 15 | July | 478 | 15 |

*Photo: Sunset Biker on the Van Sickle Connector Trail*

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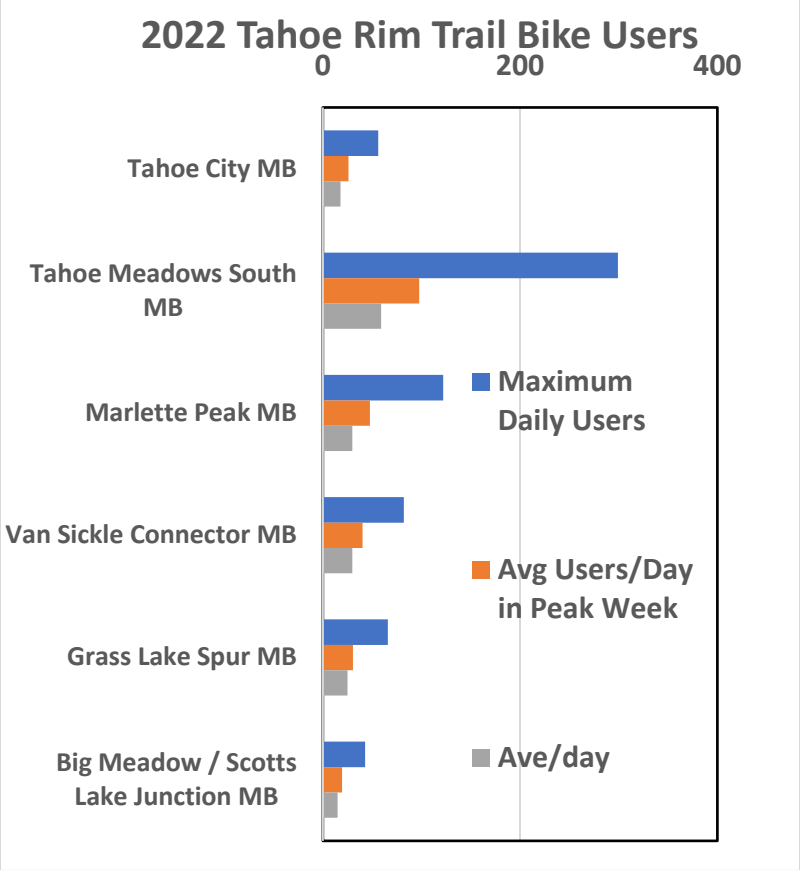
**Graphic 2.**




*Photos: EcoCounter Installation by TRTA seasonal Interns*

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Map 2: MB Trail Counter Locations

## LESSONS LEARNED

The lessons learned from the 2022 Visitor Use Monitoring program are summarized below:

1. One person should oversee the program, and there needs to be a consistent process for sharing and documenting trail counter locations. All trail counters should continue to be tracked and documented using Field Maps, an application that can sync to an online GIS map and database.
2. Reduce the number of counters in the field, being more intentional with where to collect on all nine segments.

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3. Counters need to be deployed over both popular and less popular trail sections to get the data needed for an accurate count of overall use numbers.
4. Reliability of IR counters in some of the same areas has proved unreliable, as we continue to see a fair number of incorrectly installed counters malfunction over multiple years. Counters should only be installed by a select few people who have been properly trained and have a good history of success. All counters need to be tested thoroughly before being installed.
5. More frequent monitoring is necessary for counters less than three miles from a trailhead or access point. Data should be collected and downloaded on a monthly basis and then reinstalled. This ensures that if there is a malfunction, corrections can be made.
6. One counter was found and stolen by a trail user. All attempts should be made to ensure these are hidden and secure.
7. It is not recommended that in the future, counters should be left out year-round or during winter months. Snow makes it more difficult to find counters and increases the chances of damage or loss.
8. Continue to understand where partner land management agencies (LMA) and partners are installing trail counters and share relevant TRTA trail counter locations and data. The TRTA and LMA should endeavor to share findings and install counters where further data is needed. This will greatly improve understanding of visitor use, and reduce duplicative efforts.
9. Continue to do manual counts through the Trail Ambassador program and implement findings into this report annually to compare to trail counter findings.
10. Continue remote backcountry monitoring and inventorying of campsites at the same locations and at new locations to start developing trend data.

## RECOMMENDATIONS FOR 2023 & BEYOND

In order to continue the development of a robust Visitor Use Monitoring program, both specific recommendations for 2023 and general goals for the years beyond are outlined in this section. Based on the results of this report, the specific recommendations for 2023 are as follows (note that some counters will collect data that can be useful for multiple purposes but are only listed once in the following recommendations):

IR counters should be installed in the following locations to expand knowledge on use levels where insufficient benchmark data has been collected thus far:

1) *Echo Summit Reroute*
2) *East of Watson Lake*
3) *A few miles North of Spooner North Trailhead*
4) *Select trails in Van Sickle Bi-State Park**
5) *North of Star Lake*
6) *North of the TRT/PCT junction between Twin Peaks and Stanford Rock*

*An end-of-the-year partnership meeting with the Nevada State Parks personnel revealed they had installed counters in Van Sickle Bi-State Park in 2022. Attempts should be made to collaborate to expand knowledge of trail use in this area, and, if possible, not install counters in the same areas. This will help inform future projects.

IR counters should be installed in the following locations to develop trend data:

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7) *Echo Lakes,*
8) *Near Lake Aloha,*
9) *Near Dicks Lake,*
10) *Mt. Rose Wilderness near Gray Lake,*
11) *Picnic Rock,*
12) *Big Meadow Junction– Heading past Big Meadow to Round Lake and toward Scotts Lake.*

Based on current projects that are being considered for future trail development or related trail infrastructure improvements, the following are recommended locations to install trail counters in 2023. Some of these include important connector trails to the TRT system. Given over five years of consistent data collection at many TRT locations, important connector trails for counter installation should be considered to better inform regional strategies and collaboration on trail use needs. The following are important trail counter locations for 2023 that can inform future TRT system projects:

1) *Tahoe Meadows near Chickadee Ridge,*
2) *Tahoe Meadows Interpretive Loop Trail,*
3) *Page Meadows near popular meadow areas where social trails have developed,*
4) *Bayview Connector Trail – Near Maggie's Saddle,*
5) *Upper Clear Creek Trail and TRT intersection,*
6) *Ward Creek near the Flintstones,*
7) *Near Richardson Lake,*
8) *Near Showers Lake.*

The general goals for the Visitor Use Monitoring program for 2023 and beyond are:

1) Finalize counter locations for the season prior to the close of the June Trail Operations Committee meeting adding locations where there are unknown levels of use,
2) Replace field loggers at Eco-Counters sites – Big Meadow and Picnic Rock,
3) Utilize Strava data to understand trail use patterns for hikers and bikers,
4) Utilize cellphone data from regional County plans to understand demographics better, such as the Douglas County Existing Conditions memo,
5) Reduce the amount of the trail that does not have useful data to less than 25%,
6) Utilize the trail use and trend data to leverage additional funding, resources, and improvements to the TRT system.

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